

AMENDMENTS TO THE CLAIMS:

1. (Currently amended) An optical switching equipment for switching a route of an optical signal received from any one of a plurality of optical transmission routes and outputting said optical signal to any one of a plurality of optical transmission routes, comprising:

first interfaces for transmitting or receiving the optical signals to or from another switching equipment through a plurality of first optical transmission routes;

second interfaces for transmitting or receiving the optical signals to or from a communicating equipment connected to said optical switching equipment through a plurality of second optical transmission routes;

at least one optical switch for providing a route of each of said optical signals between said first interfaces or between one of said first interfaces and one of said second interfaces; and

~~optical switches for providing a route of said optical signal between said plurality of first interfaces or between said plurality of first interfaces and said plurality of second interfaces; and~~

a control circuit for setting [[a]] the route of said each optical signal inside said at least one optical switch; wherein:

~~wherein the optical signal received from said second optical transmission route is split into a plurality of optical signals, and said plurality of optical signals is outputted to said plurality of first different optical transmission routes through a plurality of routes set in said optical switch; and each of said second interfaces at an optical signal receiving side includes means for splitting an optical signal received from a second optical transmission route into a plurality of optical signals,~~

~~said control circuit controls said optical switch to assign different routes to the split optical signals so as to output the split optical signals to different first optical transmission routes, respectively, and~~

each of said second interfaces at an optical signal transmission side includes means for receiving plural optical signals from different first optical transmission routes via the optical

switch and selecting one optical signal to output to a respective second optical transmission route.

~~as to the optical signal to be outputted to said second optical transmission route, when said plurality of routes are set in said optical switches and a plurality of optical signals are received from said plurality of first different optical transmission routes, one of said optical signals is selectively outputted to said second optical transmission route.~~

2. (Currently amended) An optical switching equipment for switching a route of an optical signal received from any one of a plurality of optical transmission routes and outputting said signal to any one of a plurality of optical transmission routes, comprising:

a plurality of optical receivers for receiving optical signals from a plurality of first optical transmission routes;

a plurality of optical distributors for receiving optical signals from a plurality of second optical transmission routes and distributing ~~said~~ received signals as a plurality of optical signals;

at least one switch optical switches provided with a plurality of input and output terminals respectively and for switchably outputting any of the optical signals received from said optical ~~receiver~~ receivers and said optical ~~distributor~~ distributors at any one of said plurality of input terminals to any one of said plurality of output terminals;

a plurality of optical transmitters for outputting the optical signals from ~~the first~~ output ~~terminal~~ terminals of said at least one optical switch to the first optical transmission routes corresponding to said first output terminals;

a plurality of optical selectors, each for receiving a plurality of optical signals from the plurality of second output terminals of said at least one optical switch, selecting any one of said plurality of the optical signals from the second output terminals, and outputting said selected signal to the second optical transmission route corresponding to said plurality of second output terminals; and

a control circuit for setting [[a]] each route of ~~the~~ an optical signal in said optical switch;

wherein the each optical signal received from said a second optical transmission route is split into a plurality of optical signals through the effect of one of said optical ~~distributor~~ distributors and said plurality of optical signals are outputted to the corresponding first different optical transmission routes through a plurality of routes set in said optical switch, and

as to the optical signal to be outputted to said one second optical transmission route, when a plurality of routes are set to said optical switch and the a plurality of optical signals are received from said plurality of first different optical transmission routes, said the optical selector for the one second transmission route selects one of said plurality of optical signals and then outputs it to said one second optical transmission route.

3. (Currently amended) An optical switching equipment as claimed in claim 1, wherein when the output destination of the optical signal received from any one of said plurality of first transmission routes corresponds to any one of said plurality of first optical transmission routes, the route through the at least one optical switch corresponding to the first optical transmission route where said optical signal is to be outputted is set to said at least one optical switches switch and the optical signal is outputted thereto.

4. (Currently amended) An optical switching equipment as claimed in claim 2, wherein when the output destination of the optical signal received from any one of said plurality of first transmission routes corresponds to any one of said plurality of first optical transmission routes, the route through the at least one optical switch corresponding to the first optical transmission route where said optical signal is to be outputted is set to said at least one optical switches switch and the optical signal is outputted thereto.

5. (Currently amended) An optical switching equipment as claimed in claim 1, wherein said at least one optical switch is composed of comprises a plurality of optical switches and the optical signal received from said a respective second optical transmission route and the

optical signal to be outputted to said respective second optical transmission route are routed to the different optical switches so as to output the split optical signals to the predetermined first different optical transmission routes and receive the optical signals from the predetermined first different optical transmission routes.

6. (Currently amended) An optical switching equipment as claimed in claim 2, wherein said at least one optical switch is composed of comprises a plurality of optical switches, and the optical signal received from said a respective second optical transmission route and the optical signal to be outputted to said second optical transmission route are routed to the different optical switches so as to output the split optical signals to the predetermined first different optical transmission routes and receive the optical signals from the predetermined first different optical transmission routes.

7. (Original) An optical switching equipment as claimed in claim 5, wherein when the output destination of the optical signal received from any one of said plurality of first transmission routes corresponds to any one of said plurality of first optical transmission routes, the route corresponding to the first optical transmission route where said optical signal is to be outputted is set to any one of said optical switches and said optical signal is outputted thereto.

8. (Original) An optical switching equipment as claimed in claim 6, wherein when the output destination of the optical signal received from any one of said plurality of first transmission routes corresponds to any one of said plurality of first optical transmission routes, the route corresponding to the first optical transmission route where said optical signal is to be outputted is set to any one of said optical switches and said optical signal is outputted thereto.

9. (Currently amended) A method of using an optical switching equipment for switching a route of an optical signal received from any one of a plurality of first ~~and second~~

optical transmission routes and second optical transmission routes and outputting the optical signal to any one of ~~said a~~ plurality of ~~first or second~~ third optical transmission ~~route routes~~, and a plurality of fourth optical transmission routes, comprising the steps of:

switching the routes of at least two optical signals respectively received from different first optical transmission routes for one of said fourth optical transmission routes;

selecting one of said at least two optical signals for which routes have been switched for said one of said fourth optical transmission routes;

outputting the selected one optical signal to said one of said fourth optical transmission routes;

~~splitting the an optical signal received from any one of said second optical transmission route routes into a plurality of optical signals and then outputting said optical signals to the different first optical transmission routes, respectively; and at least two optical signals;~~

~~as to the output signal to be outputted from any one of said plurality of first optical transmission routes to said plurality of second optical transmission routes, receiving a plurality of optical signals from said plurality of first different optical transmission routes, selecting any one of said plurality of received optical signals, and outputting said selected optical signal to said second optical transmission route.~~

switching the routes of the at least two split optical signals for different third optical transmission routes, respectively; and

outputting the at least two split optical signals for which routes have been switched to said different third optical transmission routes.

10. (Cancelled)

11. (Cancelled)

12. (Currently amended) An optical transport network ~~having comprising~~ a plurality of optical switching equipments connected with a plurality of optical transmission routes and for transmitting or receiving optical signals between said optical switching equipments, ~~comprising:~~ each of said optical switching equipments, ~~each of which includes;~~ comprising:

first interfaces for transmitting or receiving ~~the~~ optical signals to or from another optical switching equipment through a plurality of first optical transmission routes,

second interfaces for transmitting or receiving ~~the~~ optical signals to or from a communicating equipment connected with said optical switching equipment through a plurality of second optical transmission routes,

at least one optical switch for providing a route of each of said optical signals between said first interfaces or between one of said first interfaces and one of said second interfaces; and

~~optical switches for supplying routes of the optical signals between said plurality of first interfaces or between said plurality of first interface and said plurality of second interfaces, and~~

a control circuit for setting the routes of the optical signals inside said at least one optical switches switch; wherein:

in the case of adding ~~the an~~ optical signal received from said ~~a~~ second optical transmission route into said optical transport network, ~~each of said optical switching equipments operates to split said received optical signal into a plurality of optical signals and output said plurality of optical signals from a plurality of routes set in said optical switches to another plurality of different optical switching equipments through said plurality of first different optical transmission routes, respectively; said received optical signal is split into a plurality of optical signals at one of said second interfaces, and the respective split optical signals are transmitted to different optical switching equipments via the different routes in said at least one optical switch and different first optical transmission routes respectively connected to the different switch routes,~~

in the case of dropping an optical signal received from said optical transport network to a second optical transmission route, different routes in said optical switch are set for a plurality of

optical signals received from different optical switching equipments via different first optical transmission routes to one of said second interfaces, and said one of said second interfaces selects one optical signal to output

~~as to the optical signal to be dropped from said optical transport network to said second optical transmission route, when a plurality of optical signals are received through said plurality of first different optical transmission routes from another plurality of different optical switching equipments respectively by setting a plurality of routes in said optical switch, selecting one of said plurality of optical signals and outputting said signal to said second optical transmission route; and~~

~~in the case of relaying the an optical signal inside said optical transport network, outputting the optical signal received from any one of said plurality of first transmission routes to the destination first optical transmission route through the routes set in said optical switches. an optical signal received from one of said plurality of first transmission routes is output to a destination first optical transmission route through a route set in said optical switch.~~

13. (Cancelled)

14. (Cancelled)

15. (Currently amended) An optical switching equipment for switching a route of an optical signal received from any one of a plurality of optical transmission routes and then outputting said optical signal to any one of said optical transmission routes, comprising:

a plurality of optical receivers for receiving the optical signals from ~~said~~ a plurality of first optical transmission routes;

a plurality of optical distributors for receiving the optical signals from ~~said~~ a plurality of second optical transmission routes and distributing ~~said~~ received signal signals as a plurality of optical signals;

at least one optical switches switch provided with a plurality of input and output terminals respectively and for switching the optical signal received at any one of said input terminals from said an optical receiver and said or an optical distributor into any one of said output terminals and then outputting said optical signal thereto;

a plurality of optical transmitters for outputting the optical signals at the first output terminal terminals of said optical switch to the first optical transmission routes corresponding to said first output terminals;

a plurality of optical switches selectors, each for receiving a plurality of second optical signals from a plurality of second output terminals of said optical switch, selecting any one of said plurality of the optical signals from the second output terminals, and outputting said selected signal to the second optical transmission routes corresponding to said second output terminals; and

a control circuit for setting the route of the each optical signal inside said at least one optical switch.

16. (Currently amended) An optical switching equipment for switching the route of an optical signal received from any one of a plurality of optical transmission routes and then outputting said optical signal to any one of a plurality of optical transmission routes, comprising:

a plurality of optical receivers for receiving [[a]] wavelength-multiplexed optical signals from a plurality of first optical transmission routes;

a plurality of optical demultiplexers for demultiplexing said wavelength-multiplexed optical signal signals into respective frequency signals;

a plurality of first optical signal adjusters for converting the frequency of and adjusting the level of the optical signal signals outputted from each of said optical demultiplexers;

a plurality of optical distributors for receiving the optical signals from a plurality of second optical transmission routes and distributing said each optical signal received signal from a second optical transmission route as a plurality of optical signals;

at least one optical switches switch provided with a plurality of input and output terminals respectively and for switching any one of the optical signals ~~of~~ from said optical signal adjuster adjusters and from said optical distributor distributors received at any one of said input terminals into to any one of said output terminals ~~and then outputting said signals thereto~~;

a plurality of second optical signal adjusters for converting the frequency and adjusting the level of the optical signal signals outputted from said at least one optical switch;

a plurality of optical multiplexers for multiplexing the outputs of said a plurality of the second optical signal adjusters into the wavelength-multiplexed optical signal signals;

a plurality of optical transmitter transmitters for outputting the wavelength-multiplexed optical signal signals from said optical multiplexer multiplexers to the first optical transmission route routes;

a plurality of optical switchers selectors, each for receiving a plurality of optical signals from the outputs of said a plurality of second optical signal adjusters, selecting any one of said an optical signals signal, and outputting said selected optical signal to said a respective second optical transmission route; and

a control circuit for setting the routes of the optical signals in said at least one optical switches switch.